THE DER UPDATE

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Distributed Energy Resources...the Power of Choice

Industry News

H Power Installs RCUs at Rural Coops

H Power Corporation announced on May 1 that it has installed next-generation residential cogeneration units (RCUs) at rural electric cooperatives in Bowling Green, Virginia; Montrose, Colorado; Paris, Illinois; and Kearney, Missouri. A 4.5-kW proton exchange membrane fuel cell system is operating at each cooperative. The units run on propane and provide electricity and heat for homes and small businesses. Bill Cetti, CEO and President of H Power's marketing partner, Energy Co-Opportunity, commented, "The co-ops understand the most efficient and effective ways to connect a power source to a load and integrate it into a utility system. Their pragmatic observations are speeding the development of a consumer-ready product." H Power's CEO, H. Frank Gibbard, stated that the system testing is providing results that are speeding the company's efforts to commercialize its fuel cells.
H Power Corporation Press Release, May 1

H Power fuel cell being delivered to Rappahannock Electric Co-op in Bowling Green, Virginia (photo from Energy Co-Opportunity at www.e-coop.org)

Caterpillar to Distribute FuelCell Energy Units

Caterpillar and FuelCell Energy have expanded their agreement to develop and distribute FuelCell Energy's Direct FuelCell® for industrial and commercial use. The arrangement stipulates that FuelCell Energy will incorporate its fuel cell module into Caterpillar-branded generators in the 250-kW to 3-MW size range. The companies also plan to explore the development of a hybrid power system that combines Caterpillar's turbine engine technology (which includes systems packaging, electronics, and power conditioning) with FuelCell Energy's products. The agreement was signed on April 26, building upon a relationship established in November 2001, and is set to last 10 years.
Energy Info Source, April 30

Co-Ops Unveil Tool Kit For Interconnection

The National Rural Electric Cooperative Association (NRECA) has developed a collection of new business templates that will help local utilities harness the power of distributed generation. The NRECA tool kit will help utilities establish policies for the interconnection of DG units and assure the safe and reliable operation of the distribution system. "As interest in distributed generation grows, cop-ops must anticipate the effects that its application will have on their systems and the DG tool kit will help them prepare," said NRECA CEO Glenn English. The project was co-funded by National Rural Utilities Cooperative Finance Corp. and Energy Co-Opportunity. The interconnection tool contains the following resources:

- A Business and Contract Guide for Interconnection to help cooperatives and their employees move smoothly through the interconnection process
- A DG Rates Manual to help each cooperative think through the issues required to design a rate that meets that cooperative's specific goals; and Consumer Guidelines for Interconnection to educate consumers about the interconnection process
- A Technical Application Guide that provides rules of thumb that engineers at each cooperative can apply to develop detailed technical interconnection requirements that work for their system
- A Model Interconnection Application to be filled out by consumers interested in installing their own generation
- A Model Short Form Interconnection Contract for consumers installing small DG units with a capacity of 3 kW or less

The document "tool kit" is offered at no charge to interested parties and can be found at www.nreca.org/leg_reg/DGToolKit.
Business Wire, April 29

(Continued on page 3)

The much anticipated National Transmission Grid Study was released this week.

Integrated Energy Systems Peer Review Meeting

The Department of Energy's Integrated Energy Systems, Thermally Activated Technologies, and Oil Heat Combustion Program Peer Review was held April 29-May 2 at The Opryland Hotel in Nashville, TN. These three programs were peer reviewed in response to both a National Academy of Science recommendation for strategic peer review of programs under the Assistant Secretary for Energy Efficiency and Renewable Energy as well as a Department-wide strategic review to bring programs into alignment with the National Energy Policy.

A peer review of the overall DER program was held last year in November. Several of the programs within the DER office have already undergone the peer review process, including the Energy Storage, Distributed Power, Industrial Distributed Generation, Microturbine, Industrial Gas Turbines, Oil Heat Combustion, Integrated Energy Systems, and Thermally Activated Technologies Program. The Transmission Reliability Peer Review will be held on May 20-21 in Crystal City, VA. More information on past and future peer review events can be found at the DER website at www.eren.doe.gov/der. Presentations and meeting agendas for the peer reviews can also be found at this site.

The format of the two-and-a-half day event included a set of opening remarks and panel discussion that set the stage for the subsequent projects and gave context to the programs. Richard Sweetser, from Exergy Partners Corp., was the moderator for the panel session, which included Ray Splinter, Albertson Food Stores; Ronald Fiskum, U.S. Department of Energy; John Wimberly IV, I.C. Thomasson; Suzanne Watson, Northeast-Midwest Institute; and Robert Thornton, International District Energy Association. The panel was designed to discuss the role of integrated energy systems in the design, construction, and operation of buildings and the use of DER.

In the Oil Heat Combustion portion of the peer review Thomas Butcher, from Brookhaven National Laboratory, presented work on reducing NOx with liquid fuels. The main objective of the project is to provide the technical foundation to achieve the goals of 70ppm NOx (near term) and 20ppm NOx (long term) in boilers. The secondary objectives of the project are lower firing temperatures and preliminary experience with oil-fired direct absorption chillers and microturbines.

One of the thermally activated technology projects presented was the National Renewable Energy Laboratories thermal conversion facility. The facility can generate multiple simultaneous waste heat and load profiles, conduct side-by-side performance and efficiency testing, and evaluate the ability of thermal conversion devices to enhance indoor air quality and security. The goal of the project is to develop highly energy efficient thermally driven heat and mass transfer components that can be used to meet building end use loads with cost, durability, and performance in line with market expectations.

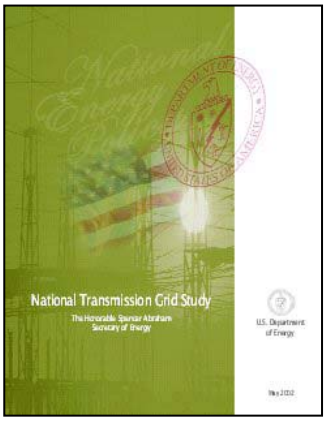
Dr. Robert Kramer, from NiSource Energy Technologies, spoke on optimizing the economic and technical viability of combined heat and power (CHP) and advanced control systems. The project will optimize energy usage, create energy and economic savings, and provide a reliable energy system for hotels. The intent is to develop a packaged CHP system for the hotel industry that will accelerate the viability and pace of adoption of CHP systems. The activities will take place in an operating hotel in Chesterton, Indiana. Dr. Kramer's work is one of four small-scale packaged integrated energy system projects.

During the peer review there was a tour of the Opryland Hotel's CHP facility. The Opryland CHP project is a stand-alone energy center that provides steam, chilled water, and electricity to the massive hotel and convention center complex. The powerhouse includes a 5 MW Solar Turbines Centaur natural gas turbine with an 80,000 lb/hour heat recovery steam generator. During the winter, additional steam is generated utilizing a duct burner in the turbine exhaust. An 80,000lb/hour gas/oil stand by boiler is included for gas curtailment and maintenance outages. Also included in the project are 8,000 tons of electricity driven centrifugal chillers and 1,000 tons of two-stage absorption chilling. An advanced energy management system is used to monitor and control all utilities.

It was developed in response to a recommendation from the President's National Energy Policy.

DOE NEWS

DOE Releases Recommendations from NTGS Study



On May 8, Secretary of Energy Spencer Abraham released the recommendations contained in the National Transmission Grid Study, which are intended to facilitate investment in the Nation's transmission infrastructure and to improve reliability and reduce electricity costs to consumers.

The information was developed in response to recommendations in the President's National Energy Policy to study the nation's transmission system, identify transmission bottlenecks, and indicate measures to eliminate those bottlenecks.

Some of the recommendations made in the National Transmission Grid Study include:

- DOE should assess the nation's electricity system every two years to identify national-interest transmission bottlenecks.
- Regional Transmission Organizations (RTOs) should be responsible for maintaining the reliability of the grid and ensuring that transmission bottlenecks are addressed.
- Entrepreneurial efforts to build merchant transmission lines that pose no financial risk to ratepayers and provide overall system benefits should be encouraged.
- DOE should continue to work with state-based associations to remove regulatory barriers to voluntary customer load-reduction programs and targeted energy-efficiency and distributed-generation programs that address transmission bottlenecks and lower costs to consumers.
- DOE should work with FERC, state Public Utility Commissions (PUC), and industry to ensure the routine collection of consistent data on the frequency, duration, extent, and costs of reliability and power quality events to better assess the value of reliability to the nation's consumers.
- DOE should work with industry to develop innovative programs that fund transmission-related research and development, with special attention to technologies that are critical to addressing transmission bottlenecks.
- DOE and the National Laboratories will continue to develop cost-effective technologies that improve the security of, protect against, mitigate the impacts of, and improve the ability to recover from disruptive incidents within the energy infrastructure.
- DOE should continue to provide training in critical infrastructure protection matters and energy emergency operations to state government agencies and private industry.
- DOE should create an Office of Electric Transmission and Distribution.

A complete list of the 51 specific recommendations can be found in a DOE press release available at www.energy.gov/HQPress/releases02/maypr/pr02080.htm. The National Transmission Grid Study Report and Issue Papers can be found on the Department of Energy NTGS Web site http://www.ntgs.doe.gov and http://www.energy.gov/NTGS/reports.html

Materials Tech Brief

For the first time, silicon nitride specimens have been coated with a more stable environmental protection system using a low-cost pack cementation technique. Silicon-based monolithic ceramics are candidate hot-section structural materials for microturbines and other combustion systems; however, the performance of these silica-forming ceramic materials in aggressive environments is limited by environmental attack by the combination of high temperature, high pressure, and the presence of water vapor. The development of environmental protection systems has become essential for enabling the long-term utilization of these materials in advanced combustion applications. Coatings that form more thermochemically and thermomechanically stable compounds are being developed to enhance the environmental stability of silicon nitride. The surface of silicon nitride is being enriched with aluminum and other metals using pack cementation to produce a coating or bond layer that does not form silica but a more stable oxide. Silicon nitride specimens have been heat treated in packed beds with chemistries similar to those used in the treatment of super alloys prior to the deposition of a thermal barrier coating. Initial experiments with aluminum-containing beds have produced surface layers containing silicon nitride and aluminum nitride. It appears that, during the treatment, the glassy grain boundary phase near the outer edges of the silicon nitride is replaced with nano-crystalline aluminum nitride. These layers should oxidize to form aluminosilicate (preferably mullite), which should exhibit improved stability as compared to silica.

What's on the Web

Resource Dynamics Corporation maintains a website that contains information about DG technologies, applications, markets, regulations, stakeholders, and publications. You can also register to receive their DG Monitor newsletter. It can be found at **www.distributed-generation.com.**

The United States has over 150,000 miles of high voltage transmission lines.

Regional Office News

On April 30th, Chuck Collins (DER) and Arun Jhaveri (FEMP) of the Department of Energy's Seattle Regional Office attended a meeting with representatives from DOE Richland and Pacific Northwest National Laboratory (PNNL) to discuss opportunities for implementing energy efficiency strategies and renewable energy generation into the clean-up process at DOE Hanford. The main focus of this group was a vitrification plant to be used in the clean-up process there, and how renewables and efficiency strategies might play a role in decreasing operational costs and environmental pollutants during this process. Several opportunities were identified at this meeting, as were other activities related to the project and how they might fit into energy and economic savings strategies. It was decided that another meeting should take place sometime in mid-June, most likely in Seattle, to broaden the participation to include other key stakeholders in the clean-up project.

Calendar of Events

MAY 2002			
12-14	American Gas Association Operations Conference	Chicago, IL	www.aga.org
12-15	The 8th National Clean Cities Conference and Expo	Oklahoma City, OK	www.ccities.doe.gov/conference.shtml
14-15	Distributed Generation Technology Seminar	Andover, MA	www.basler.com
14-16	E-Vision 2002: Shaping Our Future by Reducing Energy Intensity in the U.S.	Arlington, VA	Jeff Dowd; jeff.dowd@ee.doe.gov
14-17	Distributed Energy Conference	San Diego, CA	www.powerin.org
20	Congressional Fuel Cell Expo	Washington, DC	www.usfcc.com
20-21	Transmission Reliability Peer Review	Crystal City, VA	klong@sentech.org
20-21	Renewable Energy	Houston, TX	www.cbinet.com
23-24	FEMP DER Workshop	Atlanta, GA	www.eren.doe.gov/femp/techassist/der_resources.html
JUNE 2002			
2-5	Energy 2002 Workshop and Expo: Hot Challenges, Cool Solutions	Palm Springs, CA	(703) 243-8343, www.energy2002.ee.doe.gov
4-7	IEEE P1547 Working Group Meeting	Vail, CO	www.ieee.org
6-7	West Coast Energy Management Congress	Anaheim, CA	(703) 243-8343, www.aeecenter.org
16-18	National Accounts Conference and Exhibition (American Gas Association)	Nashville, TN	TheGasChoice.com
25-26	DER FEMP Workshop	Chicago, IL	www.eren.doe.gov/femp/techassist/der_resources.html
26-29	Building Energy 2002 and the Mid-Atlantic Sustainability Conference	East Brunswick, NJ	www.nesea.org
27-28	The Business Case for Cogeneration Regulatory Initiatives	Chicago, IL	www.cbinet.com
AUGUST 2002			
18-23	Summer Study on Energy Efficiency in Buildings	Pacific Grove, CA	www.aceee.org

Approximately 2% of the lines are from DC voltage. Source: NTGS, www.energy.gov